28. A transgenic mouse comprising a recombinant cell, wherein said cell comprises a nucleotide sequence, and wherein said nucleotide sequence comprises an I-*Sce*I site.

29. The mouse of claim 28, wherein the I-*Sce*I site has been introduced by retroviral infection.

30. The mouse of claim 29, wherein the retrovirus is generated with a vector selected from the group consisting of pMLV LTR SAPLZ, pG-MPL, pG-MtkPL, and pG-Mtk$_{\Delta}$PAPL.

31. A method for generating transgenic cells comprising the steps of:

(a) providing a cell from a transgenic animal in which at least one I-*Sce*I recognition site is inserted at a unique location in a chromosome of said cell;

(b) providing I-*Sce*I endonuclease to said cell;

(c) providing a nucleotide sequence comprising a gene of interest and a DNA sequence homologous to the sequence of the chromosomal DNA, allowing homologous recombination;

(d) transforming the cell with the nucleotide sequence of step (c); and

(e) cleaving said I-*Sce*I restriction site, whereby said cleavage promotes the insertion of said gene of interest into said chromosome of said cell at a specific site by homologous recombination.

32. The method of claim 31, wherein the I-*Sce*I site has been introduced by homologous or non-homologous recombination.

LAW OFFICES
FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N. W.
WASHINGTON, D.C. 20005
202-408-4000

33. The method of claim 31, wherein the I-*Sce*I site has been introduced by retroviral infection.

34. The method of claim 33, wherein the retrovirus is generated with a vector selected from the group consisting of pMLV LTR SAPLZ, pG-MPL, pG-MtkPL, and pG-Mtk$_{\Delta}$PAPL.

35. The method of claim 31, wherein the transformation of the cell is performed by transfection, electroporation, microinjection, lipofection, or retroviral infection.

36. The method of claim 31, wherein the cell comprises a nucleotide sequence encoding the I-*Sce*I enzyme.

37. The method of claim 36, wherein the nucleotide sequence is in a plasmid.

38. The method of claim 37, wherein the plasmid is pRSV I-*Sce*I or pCMV I-*Sce*I.

39. A method of culturing transgenic cells comprising the steps of:

(a) providing a cell from a transgenic animal in which at least one I-*Sce*I recognition site is inserted at a unique location in a chromosome of said cell; and

(b) culturing said cell under conditions that allow growth of said cell.

40. The method of claim 39, wherein the I-*Sce*I site has been introduced by homologous or non-homologous recombination.

41. The method of claim 39, wherein the I-*Sce*I site has been introduced by retroviral infection.

LAW OFFICES
FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N. W.
WASHINGTON, D. C. 20005
202-408-4000

42. The method of claim 41, wherein retrovirus is generated with a vector selected from the group consisting of pMLV LTR SAPLZ, pG-MPL, pG-MtkPL, and pG-Mtk$_{\Delta}$PAPL.

43. A method of culturing transgenic cells comprising

(a) providing a cell from a transgenic mouse, wherein said cell comprises a nucleotide sequence encoding I-*Sce*I; and

(b) culturing said cell under conditions that allow growth of said cell.

44. The method of claim 43, wherein the nucleotide sequence is in a plasmid.

45. The method of claim 44, wherein the nucleotide sequence is pRSV I-*Sce*I or pCMV I-*Sce*I.

46. A method for the activation of a specific gene in a cell comprising the steps of:

(a) inserting a nucleotide sequence comprising an I-*Sce*I site into the coding sequence of said gene, wherein said insertion inactivates expression of said gene;

(b) providing I-*Sce*I endonuclease to said cell; and

(c) cleaving said I-*Sce*I site, whereby said cleavage promotes activation of expression of said gene by homologous recombination.

47. The method of claim 46, wherein said cell is a transgenic mouse cell.--

LAW OFFICES
FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D.C. 20005
202-408-4000